6.9419
24.2120 (1049,1482,1502,1532)

20457
S/056/61/040/002/016/047
B102/B202

AUTHORS: Zhivlyuk, Yu. N., Mandel'shtam, S. L.

TITLE: Lightning temperature and thunder power

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 2, 1961, 483-487

TEXT: The authors present preliminary results of spectroscopic temperature measurements in the lightning channel in the high-current stage, and of calculations of the pressure at the front of the shock wave produced by the lightning. The conditions of channel formation and the condition of the plasma herein were first studied in spark discharges on air in the laboratory. In such experiments, the electron concentration in the spark plasma is mostly $N_e \geq 10^{17}$ cm^{-3}; the atoms and ions are in Boltzmann excitation distribution which is conserved for about 10^{-7} sec; the plasma radiates according to Kirchhoff's law practically during the entire time of its existence. During $\sim 10^{-6}$ sec the gas temperature is equal to the electron temperature $T_e = T_i = T$ so that the gas temperature is obtained when the tempera-

Card 1/6

Lightning temperature ...

ture is spectroscopically determined from the atomic lines. These results are also applicable to lightnings since in the lightning channel (according to estimations of the H_α and H_β line widths) the electron concentration is of the same order of magnitude. The authors then give estimations of the optical density of the plasma for various parts of the line NH3995 A, which are also discussed. The results for $T \sim 2.10^4$ °K, $\lambda \sim 4000$ A, channel diameter $l = 10$cm, and $N_o \sim 10^{17}$ cm^{-3} are given in Table 1; k_ω is the absorption coefficient of the plasma for the frequency ω; it is determined by the intensity law of the spectral line $I(\omega) = I_0(\omega)(1-e^{-k_\omega l})$, and by

$$k_\omega = k_0 \frac{a}{\pi} \int_{-\infty}^{+\infty} \frac{\exp(-y^2)}{a^2 + (v-y)^2} dy, \qquad (2)$$

$$k_0 = (2\pi^2 e^2/mc)(Nf/\Delta\omega_0), \qquad v = 2(\omega - \omega_0)/\Delta\omega_D.$$

Card 2/6

20457
S/056/61/040/002/016/047
B102/B202

Lightning temperature....

$I_o(\nu)$ is the radiation intensity of a black body having the same temperature as the channel. The authors took pictures of lightning spectra by night, by means of the spectrographs СП-48 (SP-48) and СП-49 (SP-49) (slit width 0.1 mm). They used Panchrom-X and "Д" (D)-type films. To until a blackening of S=0.2 was attained. Thus, sensitivity could be increased by 3-4 times. The film was then photometrically recorded by a microphotometer of the type МФ-4 (MF-4). Altogether, 9 spectrograms were evaluated (about 100 lines). Most of the lines belonged to neutral or singly-ionized O or N atoms; the lines 5600, 5471, 4542 and 4058 A can be ascribed to OIII, OV or NIII; also N_2^+ band edges and an intense continuous spectrum were found. About 50% of all lines were observed for the first time. The channel temperature was calculated from various lines; results are given in Table 2. The diverging values are due to errors in measurement. The mean temperature value in the channel, 21,000°K, is in good agreement with the results obtained by S. I. Braginskiy by the hydrodynamic

Card 3/6

Lightning temperature....

theory: $T = 4.35\,\rho_0^{1/14}\,(Jt^{-3/4})^{2/7}$. Here, ρ_0 is taken in the unit $1.29\cdot10^{-3}$ g/cm^3, J in ka, t in μsec and T in ev. This theory is then used to calculate the radius of the lightning channels, the speed of the shock wave front, and the front pressure of the shock wave. The following values are obtained: $r = 1.11\eta^{1/4}\rho_0^{5/56}J^{5/14}t^{13/56}$;

$a = 5.55\cdot10^5\eta^{1/4}\rho_0^{5/56}J^{5/14}t^{-43/56}$; $p_{front} = \frac{2\rho_0 a^2}{\gamma+1} - \frac{\gamma-1}{\gamma+1}p_0$; p_0 - atmospheric pressure, η - an energy ratio. The lightning spectra were taken at the Zvenigorodskaya stantsiya Instituta fiziki atmosfery AN SSSR (Zvenigorod Station of the Institute of Physics of the Atmosphere AS USSR) in summer 1958. The authors thank V. S. Prokudina for assistance, V. I. Krasovskiy for making possible their work at the station, and I. P. Tindo of the FIAN for assistance. A. A. Mak is mentioned. There are 3 tables and 10 references: 7 Soviet-bloc and 3 non-Soviet-bloc.

Card 4/6

20457
S/056/61/040/002/016/047
B102/B202

Lightning temperature....

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Institute of Physics im. P. N. Lebedev Academy of Sciences USSR)

SUBMITTED: June 30, 1960

Таблица 1

Расстояние от центра линии $\Delta\lambda$, A ①	$k_\omega l$				
	$\Delta\lambda_c$ (A) =0,05	0,1	0,15	0,5	2
0,00	104	79,5	65	31,5	6,2
0,08	55	51	45	27	6,2
0,16	11,8	17	19,6	18,4	6,1
0,23	8,8	9,2	10	11,8	5,9
0,31	2,7	2,9	5,2	8,4	5,7
0,38	1,0	2,1	3,5	6,1	5,5
0,45	0,9	1,3	2,1	4,4	5,2

Legend to Table 1: Distance from the center of the line in A.

Card 5/6

3.2420 (1049, 1482)

29115
S/020/61/140/005/011/022
B104/B102

AUTHORS: Vasil'yev, B. N., Voron'ko, Yu. K., Mandel'shtam, S. L. Tindo, I. P., and Shurygin, A. I.

TITLE: Preliminary results of a study of solar x-radiation by means of rockets and space ships

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 5, 1961, 1058-1061

TEXT: By means of two geophysical rockets (July 21, 1959, altitude 105 km), the second space ship (August 19-20, 1960, altitude of perihelion 305 km, aphelion 320 km), and the third space ship (December 1-2, 1960, perihelion 180 km, aphelion 249 km), solar radiation in the spectral range below 10 Å was studied. End-window photon counters with aluminum coated (2μ) mica windows (1.6 mg/cm^2, d = 4 mm) were attached outside the apparatus container which left the rocket and turned automatically to the sun. By means of magnetic systems, the windows of counters were shielded from 15-20 kev electrons which might cause bremsstrahlung. At an altitude of 95 km, the counting rate of counters oriented toward the sun increased. This radiation was considered to be

Card 1/4

Preliminary results of a. .

an x-radiation. Using data of V. V. Mikhnevich et al. (Izv. AN SSSR ser. geofiz., no. 11, 1393 (1957)) results of measurement were extrapolated for the boundary of atmosphere. Radiation fluxes (2.10 Å) obtained were $7.3 \cdot 10^{-4}$ and $3.2 \cdot 10^{-4}$ erg/cm^2·sec. On the second space ship, six end-window photon counters with beryllium windows (0.1 mm thick, 7 mm in diameter) were used. Counters were arranged vertical to each other. The counting rate amounted to some thousand pulses/sec when the counters were exposed to solar radiation. On that part of the orbit which was in the earth's shadow it was some ten pulses/sec (cosmic background), and reached high values only when the orbit approached the outer radiation belt. From the results of measurements in the shadow region, the authors concluded that a radiation from the radiation belt did not occur below 30-40° north and 20-30° south. A radiation flux of $7.6 \cdot 10^{-4}$ erg/cm^2·sec was obtained. On the third space ship, two counters with mica windows (1.6 mg/cm^2, d = 4 mm) covered on both sides with aluminum foils (5μ) were switched in parallel. These two counters were oriented toward the sun. Two other counters of the same type were arranged vertical to the former. Tantalum plates were located [illegible]

Card 2/4

Preliminary results of a...

of the windows of these control counters. They recorded radiation caused by slowing down electrons in the tantalum plates. In the instrument container two other beryllium window counters were installed. This ... was possible to separate the background of x-radiation caused by electrons from the solar x-radiation. An x-radiation flux of $2.4 \cdot 10^{-4}$ erg/... was obtained in the range 2-10 Å. The electron temperature of solar radiation in the spectral range investigated was estimated to be ... I. S. Shklovskiy (Izv. Krymsk astrofiz. obs., 4, 80 (1949)). T. V. Kazachevskaya and G. S. Ivanov-Kholodnyy (Astr. zhurn., 36, 1022 (1959)), S. N. Vernov and A. Ye. Chudakov (Usp. fiz. nauk 70 no. 4 ... (1960)), and L. V. Kurnosova et al. (Sborn. Iskusstvennyye sputniki Zemli no. 10 (1961)) are mentioned. There are 4 figures and 7 references: 5 Soviet and 2 non-Soviet. The three most recent references to English-language publications read as follows: T. A. Chubb, H. Friedman, R. W. Kreplin, J. Geophys. Res., 65, no. 6, 1831 (1960); H. Friedman, Astronautics, no. 11, 42, 128 (1960); J. A. Van Allen, L. A. Frank, Nature, 183, 430 (1959).

Card 3/4

29115
S/020/61/140/005/0[illegible]/[illegible]
B104/B102

Preliminary results of a...

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev of the Academy of Sciences USSR)

PRESENTED. May 24, 1961, by D. V. Skobel'tsyn, Academician

SUBMITTED: April 19, 1961

4

Card 4/4

MANDEL'SHTAM, Sergey, L. and TERENIN, A. N. (USSR)

"Vacuum u v Absorption Spectroscopy."

report to be submitted for the 1st Intl. Conference on Ultraviolet Vacuum Radiation Physics.
University of Southern California
16-19 April 1962

4

MANDELSHTAM, S. L., VASILYEV, B. N., VORONKO, Yu. K., TINDO, K. P., SHURYGIN, A.

"Measurements of Solar X-ray Radiation"

Soviet Papers Presented at Plenary Meetings of Committee on Space Research (COSPAR) and Third International Space Sumposium, Washington, D. C., 23 Apr - 9 May 62

3,2430
3,2100

S/169/62/000/008/066/090
E032/E114

AUTHOR: Mandel'shtam, S.

TITLE: Scientific results of space flights. Studies of solar X-ray emission with the aid of rockets and satellites

PERIODICAL: Referativnyy zhurnal, Geofizika, no.8, 1962, 8-9, abstract 8 G 68. (Newspaper 'Pravda', no.102, April 12, 1962, 4.

TEXT: Experimental studies of solar X-ray emission were carried out with the aid of apparatus carried by rockets. The radiation detectors were in the form of photon counters mounted on the outside of the instrument capsule. As soon as the motor stopped working the capsule separated from the rocket and was automatically orientated to face the sun, reaching an altitude of about 105 km. During the flight the capsule was oriented in space so that one of the photon counters faced the sun and the other (control counter) was at 15° to this direction. The two counters gave similar readings (due to cosmic rays) up to about 90 km. Beginning with ~92 km, the counter facing the sun showed

Card 1/4

a rapid increase in the counting rate due to solar X-ray emission. It follows from these measurements that the intensity of the emission falls rapidly in the short-wave region. The theoretical energy distribution, derived on the assumption that the main physical mechanism responsible for the production of X-rays in this spectral region involves the generation of the so-called braking radiation during the passage of electrons near [illegible] coronal plasma, is in good agreement with experimental observations. Rocket experiments are only capable of recording solar [illegible] during short time intervals. It was established that [illegible] intensity of the radiation near the edge of the spectrum [illegible] than 20 Å) is apparently a rapidly varying function of time. Longer determinations were carried out during the flight of the second and third space ships. The apparatus was generally similar to that used in rocket experiments. The radiation detectors were in the form of photon counters with windows made of beryllium foil and thin mica. The number of pulses recorded by the counters was read out electronically every three minutes and was stored in a special memory device on board the space-ship during 15 circuits

orbits. On the 14th orbit a signal was sent from the earth and the stored information was transmitted to the earth through the telemetric system. The solar X-ray emission in the region 2-10 Å was determined in this way for about 24 hours during the flight of the second space-ship (19-20 August 1960), and during a similar period of time during the flight of the third space-ship (December 1-2, 1960). The second space-ship carried an apparatus in which the radiation was detected with vacuum photomultipliers incorporating filters, so that different parts of the spectral region 2-100 Å and of the neighbourhood of the hydrogen line 1.2.5 Å could be examined in turn. During the flight of the second space-ship there were chromospheric flares accompanied by bursts of solar radio emission. Apparently, some flares are also accompanied by an increase in the intensity of X-ray radiation and a change of its composition; the short-wave edge of the solar radiation is shifted towards shorter wave lengths. The resulting short-wave radiation is very penetrating and reaches heights of the order of 70 km above the earth's surface. During such flares the lower layer of the ionosphere moves down by 10-20 km.

Card 3/4

Scientific results of space ... S/169/62/000/008/066/090
E032/E114

The X-ray emission of the quiet sun and of small flares is relatively soft and is strongly absorbed by matter.

[Abstractor's note: Complete translation.]

Card 4/4

MANDELSHTAM, S. L., TINDO, I. P., VORON'KO, Yu. K., VASILYEV, B. N., and SHURYGIN, A. I.

"The Intensity of The X-ray Radiation of The Sun Near The Short-Wave Edge of The Spectrum"

report presented at the 13th Intl. Astronautical Federation Congress, (FAI) Varna, Bulgaria, 23-29 Sep 1962

MANDEL'SHTAM, S.L.

Introductory note. Izv. AN SSSR. Ser. fiz. 26 no.7:842-845 Jl '62. (MIRA 15:8)

(Spectroscopy--Congresses)

MANDEL'SHTAM, S.L.

Some problems in the theory of spectrum analysis. Izv. AN SSSR. Ser. fiz. 26 no.7:848-855 Jl '62. (MIRA 15:8)
(Spectrum analysis)

S/020/62/142/001/015/021
B104/B102

AUTHORS: Mandel'shtam, S. L., Voron'ko, Yu. K., Tindo, I. P., Shurygin, A. I., and Vasil'yev, B. N.

TITLE: Study of solar X-ray emission during the total solar eclipse on February 15, 1961

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 142, no. 1, 1962, 77-80

TEXT: The shortwave range (< 10 Å) of the solar spectrum was examined with photon counters described in previous papers of the authors (DAN, 140, no. 5, 1058 (1961); Sborn. Iskusstvennyye sputniki Zemli, (a) no. 10, 1961, p. 13; (b) no. 11, 1961, p. 3). A. P. Lukirskiy helped in determining the spectral sensitivity of the apparatus at the Leningradskiy gosudarstvennyy universitet (Leningrad State University), using a method of Lukirskiy, M. A. Rumsh, and L. A. Smirnov (Optika i spektroskopiya, 9, 505 (1960)). The counters had been developed under the supervision of I. A. Prager and S. M. Perel'man. The counter block was mounted on the outside of the instrument container of a geophysical rocket. The counters always faced the Sun. The container reached an altitude of about 96 km. The emission

Card 1/2

of the solar corona is continuous in the spectral region in question and has no intense lines. The energy distribution of solar emission and the energy flux in the spectral range under consideration were determined from the variations of the count rate with altitude, with the spectral sensitivity of the counters, and with the mass absorption coefficient of air (Fig. 3). The emission of the totally covered corona in the spectral range in question had an intensity of $4 \cdot 10^{-4}$ erg/cm^2·sec. The shortwave part of the solar spectrum is emitted from all those parts of the corona, in which the 5303 Å line is also excited. There are 4 figures, 1 table, and 7 references: 4 Soviet and 3 non-Soviet. The two references to English-language publications read as follows: G. Elwert, J. Atm. Terr. Phys., 12, 187 (1958); J. Geophys. Res., 66, 391 (1961).

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev of the Academy of Sciences USSR)

PRESENTED: July 4, 1961, by A. A. Blagonravov, Academician

SUBMITTED: June 27, 1961

L 12995-66 EWT(1)/FCC/EWA(h) GW

ACC NR: AR6000794 SOURCE CODE: UR/0169/65/000/009/A013/A013

SOURCE: Ref. zh. Geofizika, Abs. 9A75

70
B

AUTHOR: Mandel'shtam, S. L.; Vasil'yev, B. N.; Voron'ko, Yu. K.; Tindo, I. P.; Shurygin, A. I.; Fetisov, Ye. N.

TITLE: Using artificial satellites and rockets to study the short-wave end of the solar spectrum

CITED SOURCE: Tr. Komis. po spektroskopii. AN SSSR, vyp. 1, 1964, 36-54

TOPIC TAGS: solar radiation, artificial earth satellite, solar corona

TRANSLATION: Solar radiation was experimentally and theoretically studied in the spectral region with wavelengths shorter than 10 angstroms. It was found that the radiation has a continuous spectrum and is due to recombination of electrons and "heavy" ions in the solar corona. Various experimental measurements of the electron temperature in the radiating regions of the corona gave values lying between 1.5 and $4 \cdot 10^{6}$ Kelvin; the radiation flux at the boundary of the terrestrial atmosphere is $2\text{-}8 \cdot 10^{-4}$ erg/cm^2·sec.

SUB CODE: 08, 22/

Card 1/1 Hw

UDC: 523.72:629.195.2:629.192.2/3

MANDEL'SHTAM, S. L.

"Investigation of the x-ray radiation of the sun with help of satellites and geophysical rockets."

report presented at 103rd Mtg, Soc of German Physicists & Medical Doctors, Weimar, E. Germany, 4-9 Oct 64.

L 20992-65 FSS-2/EWT(l)/EWG(v)/FCC/EEC-4/EEC(t)/EWA(h) Pe-5/Pi-4/Po-4/Pq-4/
Pee-2/Peb ESD(t)/ESD(gs)/SSD/AFWL/AFETR GW/WS

ACCESSION NR: AP5000174 S/0293/64/002/006/0920/0927

AUTHOR: Zhitnik, I. A.; Krutov, V. V.; Malyavkin, L. P.; Mandel'shtam, S. L.

TITLE: The solar image in the far ultraviolet spectral range

SOURCE: Kosmicheskiye issledovaniya, v. 2, no. 6, 1964, 920-927

TOPIC TAGS: geophysical rocket, solar spectrum, ultraviolet spectral range, rocket container, telemetric record, continuous spectrum, floccull field

ABSTRACT: Solar images were obtained by a specially arranged apparatus in a geophysical rocket equipped for photographing the sun in the 10—400-Å wavelength range. The apparatus was located within a container which was maintained in a stable position during the whole flight of the rocket. The trap door of the container was opened at a height of 120 km during the ascent and closed at 200 km during the descent. The rocket flight reached a maximum height of 500 km. The position of the container relative to the direction of the sun was

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L 20992-65
ACCESSION NR: AP5000174

determined from the telemetric records of the transmitter. The spectral range from 10 to 90 Å was not recorded. Good records were obtained in the 170—400-Å range. The HeII lines at 228, 256, 304 Å, the HeII continuous spectrum, and the following lines of other elements: FeXV at 284 Å, FeXVI at 335 Å, and MgIX at 369 Å were clear. Regions of intense ultraviolet radiation were located above floccull fields. Orig. art. has: 6 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 27Feb64 ENCL: 00 SUB CODE: AA

NO REF SOV: 001 OTHER: 010 ATD PRESS: 3145

Card 2/2

L 3432-66 EWT(d)/EWP(v)/T/EWP(k)/EWP(h)/EWT(l)/ETC(m) WW/GS

ACCESSION NR: AT5023634 UR/0000/65/000/000/0531/0532 33 26 Bt1

AUTHOR: Mandel'shtam, S. L.

TITLE: Solar x radiation (Thesis) 12

SOURCE: Vsesoyuznaya konferentsiya po fizike kosmicheskogo prostranstva. Moscow, 1965. Issledovaniya kosmicheskogo prostranstva (Space research); trudy konferentsii. Moscow, Izd-vo Nauka, 1965, 531-532

TOPIC TAGS: solar x radiation, solar corona, solar chromosphere, solar flare

ABSTRACT: A survey of the principal results of experimental and theoretical studies of solar x-radiation in the spectral region below 100 Å is presented. The x-radiation of the quiet sun can be subdivided into two components, a quasi-stable component from the undisturbed regions of the corona and a slowly varying component from hotter and denser regions of the solar corona. The latter component predominates in the region 2-20 Å with the radiation flux ranging from 10^{-5} to 10^{-2} erg/cm^2 sec. The two components are comparable in the region 40-100 Å with a radiation flux of 0.1-0.5 erg/cm^2 sec. The regions of predominant generation of x-radiation are located above strong calcium flocculi in the solar

Card 1/2

L 3432-66

ACCESSION NR: AT5023634 7

chromosphere. Flares of x-radiation can be divided into two classes. Class I flares, lasting many minutes, are thermal and are caused by heating of the corona plasma in the flare region. Class II flares, lasting on the order of tens of seconds and occurring in the initial phase of several optical flares, are non-thermal in origin and are bremsstrahlung of accelerated electrons resulting from instabilities in the corona plasma. The article is based on the works of B. N. Vasil'yev, I. A. Zhitnik, L. P. Malyavkin, V. P. Prokudina, I. P. Tindo, A. I. Shurygin, and Ye. P. Fetisov.

ASSOCIATION: none [illegible] kosmicheskogo prostranstva, [illegible]-Union Conference on [illegible]

SUBMITTED: 02Sep65 ENCL: 00 SUB CODE: AA

NO REF SOV: 000 OTHER: 000

Card 2/2 nd

L 20965-66 EWT(1)/FCC/EWA(h) GW

ACCESSION NR: AP5026054 UR/0293/65/003/005/0737/0750
523.72:629.192.2:550.3

AUTHOR: Mandel'shtam, S. L.; Prokudina, V. S.; Tindo, I. P.; Fetisov, Ye. P.

TITLE: On the x-radiation of the quiet sun

SOURCE: Kosmicheskiye issledovaniya, v. 3, no. 5, 1965, 737-750

TOPIC TAGS: sun, solar emission, quiet sun, solar x radiation, solar physics, solar activity, disturbed sun

ABSTRACT: The results of computations of the thermal x-radiation of the sun in the wavelength region shorter than 20 Å are examined, and the computed values of radiation fluxes compared with experimental data. To obtain a "volumetric measure of the emission" of the various regions of the corona that enter into the computational data, experimental values based on radiospectroheliograms at a wavelength of 9.1 cm are used. The temperature of the undisturbed corona is taken as $\sim 1 \cdot 10^6$ K, while for regions having an increased measure of emission temperature values lying within the limits of $1.5-2.5 \cdot 10^6$ K are assigned. Computational and experimental values of x-ray flux are in good agreement for different levels of solar activity, sugessting that the solar x-radiation in the region $\lambda < 20$ Å is of a thermal nature. It is composed of the virtually constant component emitted

Card 1/2

L 20965-66
ACCESSION NR: AP5026054

from undisturbed coronal regions to which the slowly changing component, corresponding to "hotter" radiation from active coronal regions, is superimposed. This latter component changes greatly depending on the number and size of the active regions. It is noted that while both the active and quiet regions make comparable contributions in the decimeter radio range, the contributions of the quiet regions are negligible in the x-ray region at $\lambda < 20$ Å. Therefore, no proportionality can be expected between the total flux of radio and x-radiation. To verify these findings, it is planned to scan the solar disk in two spectral ranges, viz, 2—10 and 8—18 Å. This will make it possible to determine T_e and N_e simultaneously but independently, and to compile a chart showing the distribution of N_e and T_e over the solar disk. Orig. art. has: 3 figures, 7 tables, and 7 formulas. [DM]

ASSOCIATION: none

SUBMITTED: 16May64 ENCL: 00 SUB CODE: AA

NO REF SOV: 011 OTHER: 014 ATD PRESS: 4116

Card 2/2

L 3435-66 EWT(1)/FCC/EWA(h) GS/GW

ACCESSION NR: AT5023635 UR/0000/65/000/000/0533/0533

AUTHORS: Zhitnik, I. A.; Krutov, V. V.; Malyavkin, L. P.; Mandel'shtam, S. L.

TITLE: Image of the sun in the far short wave region of the spectrum (Thesis)

SOURCE: Vsesoyuznaya konferentsiya po fizike kosmicheskogo prostranstva. Moscow, 1965, Issledovaniya kosmicheskogo prostranstva (Space research); trudy konferentsii. Moscow, Izd-vo Nauka, 1965, 533

TOPIC TAGS: solar X radiation, solar facula

ABSTRACT: The image of the sun in the short wave region of the spectrum 170-400 Å was obtained by using apparatus placed on a geophysical rocket launched June 6, 1963, which reached an altitude of 500 km. It was observed that regions of enhanced intensity of the short wave radiation are located above facula fields and remain on the sun for at least a solar day.

ASSOCIATION: none

SUBMITTED: 02Sep65 ENCL: 00 SUB CODE: AA

NO REF SOV: 000 OTHER: 000

Card 1/1

L 18604-65 EWG(j)/EWA(k)/FBD/EWT(l)/EEC(k)-2/EEC(t)/T/EEC(b)-2/EWP(k)/EWA(m)-2/
EWA(h) Pn-4/Po-4/Pf-4/Peb/Pi-4/Pl-4/ BSD/AFWL/ASD(a)-5/RAEM(a)/APTC(p)/ASMP-2
APETR/SSD/ESD(gs)/ESD(t) WG
ACCESSION NR: AP5000364 S/0056/64/047/005/2003/2005

AUTHOR: Mandel'shtam, S. L.; Pashinin, P. P.; Prokhindeyev, A. V.; Prokhorov, A. M.; Sukhodrev, N. K.

TITLE: Investigation of the "spark" created in the air by a focused laser beam

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 5, 1964, 2003-2005

TOPIC TAGS: laser, ruby laser, air breakdown, dielectric breakdown, laser beam spark

ABSTRACT: Experimental investigation of air breakdown in the focus of a Q-switched ruby-laser beam yielded the following preliminary results. The laser, with a 30-megawatt peak power, had an output pulse half-width of 50 μsec, a beam diameter of 12 mm, and an output beam energy of 1.5 j. The elongated spark produced in the air had an axial length of 10—15 mm; the threshold power sufficient to cause such a spark was found to be 5—10 megawatts. The entire air breakdown process was photographed with a high-speed SFR-2 camera at 625,000 frames per second. The resolution thus obtained was, however, inadequate to ana-

Card 1/2

lyze the most interesting initial period of the discharge. It was found that 40% of the laser-output energy passes through the focal point; the rest is absorbed in a small volume near the focus of the lens. The energy of the laser is liberated in an initial volume estimated at 10^{-4} cm^3. The laser beam creates a radial shock wave which follows the pattern of channel formation in the usual spark discharges. A spectroscopic analysis showed the presence of singly charged NII and OII, as well as atomic nitrogen and an H_α line. In contrast to the spark, that involving the laser is characterized by a strong, continuous background, and by very broad lines, most of which are unresolved multiplets. These characteristics indicate a high electron concentration in the laser spark, reaching $2 \cdot 10^{18}$ cm^{-3}. The spark temperature, computed with a fairly low accuracy was 30,000—60,000K. Orig. art. has: 3 figures.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR)

SUBMITTED: 03Aug64 ENCL: 00 SUB CODE: EC

NO REF SOV: 004 OTHER: 003 ATD PRESS: 3154

L 6442-65

ACCESSION NR: AP5012636 UR/0051/65/018/005/0923/0925 28
535.33 B

AUTHORS: Mandel'shtam, S. L.; Fedoseyev, S. P.; Kononov, E. Ya.; Lebedev, S. V.
55 55 55 55

TITLE: Laboratory reproduction of the short wavelength section of the solar spectrum

SOURCE: Optika i spektroskopiya, v. 18, no. 5, 1965, 923-925

TOPIC TAGS: solar corona, solar plasma, solar spectrum, solar UV radiation, high temperature plasma, controlled thermonuclear reaction

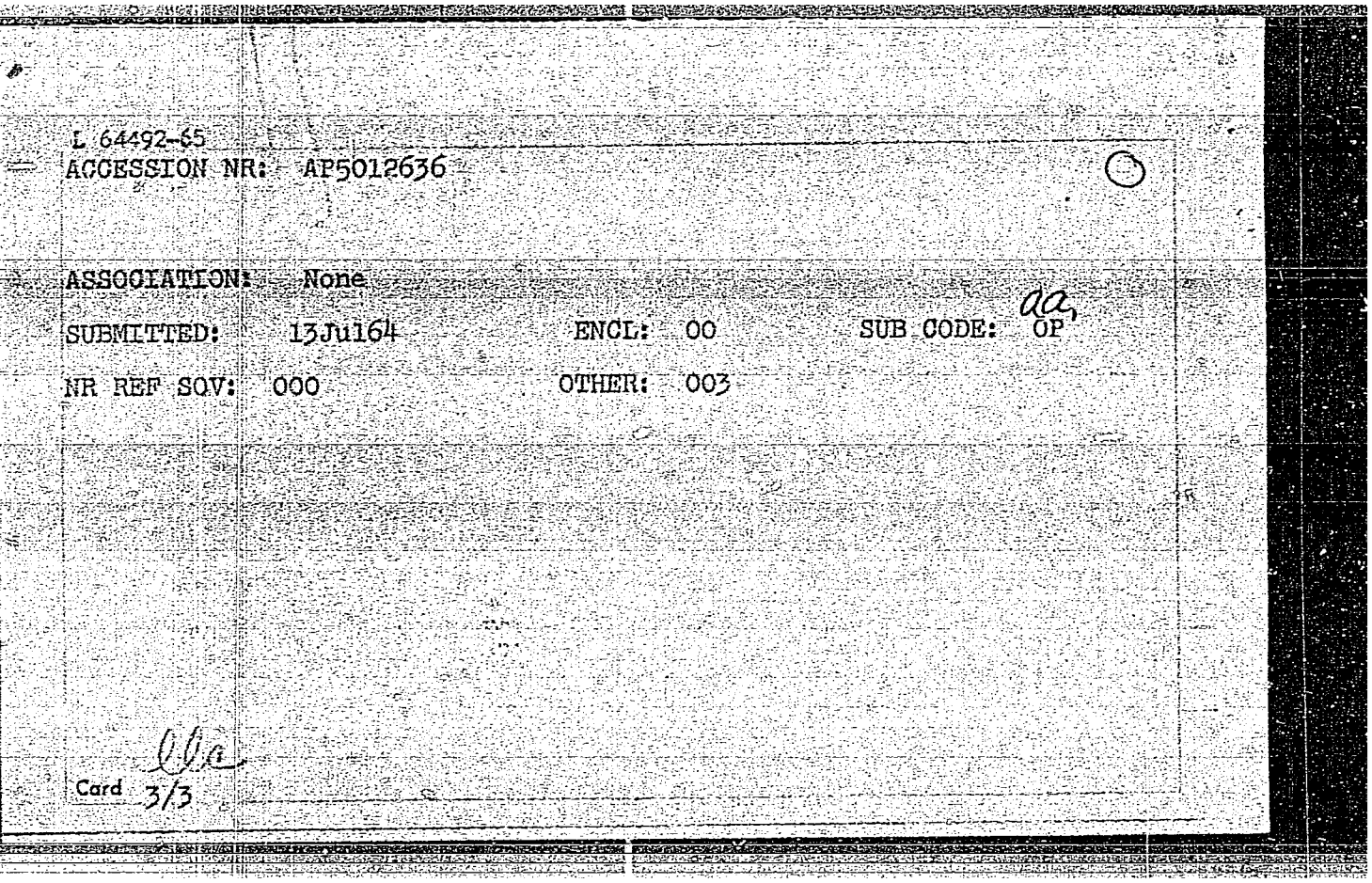
ABSTRACT: Interest in this section of the spectrum is prompted by the fact that satellites and rockets make it possible to obtain the short-wavelength spectra of the solar corona, so that these spectra need be more precisely identified. The identification of the corresponding lines is necessary for the obtaining of information from these spectra about the chemical compositions and physical state of

Card 1/3

L 64492-65
ACCESSION NR: AP5012636

coronal plasma (temperature, density, macroscopic motion of the plasma etc.). Similar problems arise in investigations of hot plasma in connection with work on controlled thermonuclear reactions. Investigations, using hot plasma, carried out in the author's laboratory are described. The authors present the vacuum spark spectra obtained between iron electrodes, which show a significant number of lines that coincide with the lines in the solar spectrum, thus making identification of the other lines easier. The wavelengths of the spectral lines were calculated using certain lines of O V as references. The accuracy of the wavelength measurement is taken to be $\pm$ 0.04 A. The lines present in the spectra were found to be those of ionized iron atoms. It follows that the coincident lines of the solar spectrum, taking into account the possibility of accidental coincidence, also belong to iron ions. The question as to which iron ions these lines belong to is presently under investigation by the authors, although tentatively they are identified as belonging to FeV, FeVI, FeVII, and FeVIII, as well as FeIX. 'The authors are grateful to R. Tousey for supplying the solar spectrum and consenting to its publication.' Orig. art. has: 1 figure

Card 2/3



L 64492-65
ACCESSION NR: AP5012636

ASSOCIATION: None

SUBMITTED: 13Jul64 ENCL: 00 SUB CODE: aa, OP

NR REF SOV: 000 OTHER: 003

Card 3/3

MILLIONSHCHIKOV, M.D., akademik; ARUTYUNOV, K.B.; NESMEYANOV, A.N., akademik; TAL'ROZE, V.L., doktor khim.nauk; PAVLENKO, V.A.; KOTEL'NIKOV, V.A., akademik; PETROV, B.N., akademik; NOVIKOV, I.I.; MANDEL'SHTAM, S.L., doktor fiz.-matem.nauk; VAYNSHTEYN, B.K.; SHUMILOVSKIY, N.N., akademik

Problems in the manufacture of scientific instruments. Vest.AN SSSR 35 no.6:3-20 Je '65. (MIRA 18:8)

1. Glavnyy konstruktor Spetsial'nogo konstruktorskogo byuro analiticheskogo priborostroyeniya (for Pavlenko). 2. Chleny-korrespondenty SSSR (for Novikov, Vaynshteyn). 3. AN Kirgizskoy SSR (for Shumilovskiy).

L 4387-66 EWT(l)/EPF(c)/EPA(w)-2/EWA(m)-2/T IJP(c)

ACC NR: AP5017910 UR/0051/65/019/001/0145/0146

535.33: 537.66: 546.294

AUTHOR: Kononov, E. Ya.; Mandel'shtam, S. L.

TITLE: Spectra of multiply ionized krypton atoms

SOURCE: Optika i spektroskopiya, v. 19, no. 1, 1965, 145-146, and insert facing p. 146

TOPIC TAGS: krypton, gas ionization, electric discharge ionization, ionized plasma, plasma pinch, ionization spectrum

ABSTRACT: The research was stimulated by the fact that there are few published data on the spectra of multiply ionized gases and by the increasing importance of this subject to plasma physics. The ion source was a theta pinch device consisting of a quartz chamber 50 mm in diameter, in which a discharge was produced by a coil fed from a capacitor bank (36 μf, 30 kv). The current through the coil was in the form of damped oscillations with a period of 12 μsec and produced a maximum magnetic field of 60 kOe. The chamber was filled with hydrogen mixed with 10% krypton to a total pressure on the order of 0.1 mm Hg. The chamber was in direct contact with the slit of a DFS-6 vacuum diffraction spectrograph. High speed photographs of the process, taken with an SFR camera, indicate that the gas is ionized during the first half-cycle of the magnetic field. During the second and several subsequent half-cycles the plasma experiences shock compression accompanied by intense luminescence. The

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L 4367-66

ACC NR: AP5017910

3

spectrum of the krypton in the 65-110 Å range exhibited clearly groups of lines having as their analogs the corresponding line groups of Rb, Sr, and Y. The close similarity of the spectra of Kr and Rb suggests that they are due to transitions of the same type. The considerable line intensity indicates that the process of multiple-ion production is highly efficient. "The authors thank S. V. Lebedev for participating in the construction of the equipment." Orig. art. has: 2 figures. 4,55

ASSOCIATION: None

SUBMITTED: 05Jan65 ENCL: 00 SUB CODE: OP

NR REF SOV: 002 OTHER: 006

Card 2/2

L 38564-66 FSS-2/EWT(1)/FCC TT/GW

ACC NR: AP6007751 SOURCE CODE: UR/0293/66/004/001/0170/0172

AUTHORS: Kurnosova, L. V.; Mandel'shtam, S. L.; Razorenov, L. A.; Tindo, I. P.; Fradkin, M. I.

ORG: none

TITLE: Occurrences of transient increase in the flux of heavy nuclei following an x-ray radiation burst

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 1, 1966, 170-172

TOPIC TAGS: x radiation, heavy nucleus, artificial satellite, signal to noise ratio, artificial satellite observation, solar atmosphere, solar x radiation

ABSTRACT: The transient increase in the flux of heavy nuclei with $Z \geq 15$ is discussed for the two periods 22 hr, 31 January, and 02 hr 15 min, 14 February 14, 1964. The duration of the flux was about 16 minutes and seemed to correspond to an x-ray burst recorded by the instruments on the artificial satellite "Elektron-2." The instruments were Cherenkov detectors with an area of 5 cm^2. During this sudden increase, the satellite was at an altitude of 6.6×10^4 km and the wavelength of the recorded x-rays was $\lambda < 10$Å. It is shown after some detailed discussion that this event could not be caused by statistical fluctuations because the chances for recording 100 such events on the basis of statistical fluctuations in x-rays would be less than 8.2×10^{-2}. Orig. art. has: 2 figures and 2 formulas.

SUB CODE: 04, 20/ SUBM DATE: 26Jul65/ ORIG REF: 004

L 62764-65 EWA(k)/FBD/EWG(r)/EWT(1)/EEC(k)-2/T/EEC(b)-2/EWP(k)/EWA(m)-2/EWA(h)
Pm-4/Pn-4/Po-4/Pf-4/Peb/Pi-4/Pl-4 SCTB/IJP(c) WG

ACCESSION NR: AP5019225 UR/0056/65/049/001/0127/0134 67 66 B

AUTHOR: Mandel'shtam, S. L.; Pashinin, P. P.; Prokhorov, A. M.; Rayzer, Yu. P.; Sukhodrev, N. K. 25

TITLE: Investigation of a spark in the air due to a focused laser beam. II

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 1, 1965, 127-134

TOPIC TAGS: gas breakdown, air breakdown, plasma heating, Doppler shift, laser beam scattering

ABSTRACT: This article is a continuation of an earlier work (S. L. Mandel'shtam, P. P. Pashinin, A. V. Prokhindeyev, A. M. Prokhorov, and N. K. Sukhodrev, ZhETF, 47, 2003, 1964), and presents the results of an experimental investigation of the initial shape of the laser-induced air breakdown. A 2—2.5-j ruby laser with a Q-switch (40 nanosecond duration) was used. The plasma temperature produced in the focal region was determined on the basis of the recombination radiation spectrum in the soft x-ray range ($\lambda \geq 10$ Å) and was found to be 50—60 ev. The measurements were made by means of photon counters with aluminum and beryllium windows 3 and 8 mm in diameter, respectively. A study of laser emission scattered on plasma in-

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L 62764-65

ACCESSION NR: AP5019225

dicated that the ionization front moves toward the focusing lens with a velocity of $\sim 10^7$ cm/sec measured on the basis of the Doppler shift of the scattered light. The motion of the ionized region under these conditions can be explained in terms of three mechanisms: 1) the hydrodynamic mechanism, 2) the light mechanism, and 3) the successive breakdown mechanism. All three mechanisms were fully discussed by Rayzer in an earlier article (ZhETF, 48, 1508, 1965). Under the experimental conditions in this work, the first mechanism is considered the most probable. Values for the velocity of the detonation wave front (105 and 133 km/sec) and the plasma temperature behind the plasma ($\sim 910 \cdot 10^3$ and $720 \cdot 10^7$ K), respectively, estimated on the basis of this mechanism are in satisfactory agreement with the experimental data. Orig. art. has: 1 table, 5 figures, and 7 formulas. [YK]

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR)

SUBMITTED: 19Feb65 ENCL: 00 SUB CODE: EC,ME

NO REF SOV: 009 OTHER: 010 ATD PRESS: 4055

Card 2/2

L 29732-66 EWT(l) IJP(c) AT

ACC NR: AP6018343 SOURCE CODE: GE/0036/66/006/001/0001/0008

AUTHOR: Mandel'shtam, S. L.; Pashinin, P. P.; Prokhorov, A. M.; Rayzer, Yu. P.; Sukhodrev, N. K.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR, Moscow (Fizicheskiy institut AN SSSR)

TITLE: Investigation of a spark in air formed during focusing of emission from a laser

SOURCE: Beitrage aus der Plasma Physik, v. 6, no. 1, 1966, 1-8

TOPIC TAGS: ~~laser; nonlinear optics; air breakdown~~ laser emission, plasma decay, laser beam, ruby laser, plasma temperature, line shift, Doppler shift

ABSTRACT: An experimental investigation was conducted of air breakdown produced by a Q-switched ruby laser (pulse energy 2—2.5 j, pulse duration 30 μsec). The authors analyzed the last two stages of the breakdown process, which according to them can be subdivided into the following three stages: 1) the breakdown stage (rapid increase in the number of free electrons); 2) the quasi-stationary stage (dense plasma is maintained by the absorption of energy of the laser beam); and 3) the afterglow stage (decay of plasma after the laser pulse ceases). From the soft x-ray emission of the plasma (at about 10 Å) due to continuous recombination of N^{5+}, N^{6+}, N^{7+}, O^{6+}, O^{7+}, O^{8+} — the maximum electronic temperature of the plasma in the breakdown region was determined to be ≈ 60 ev. The width of the laser line scattered by the plasma during the second stage was determined to be ≈ 1—1.4 Å; the shifting of the line was found to vary at different positions near the focal region of the laser beam with the maximum shift

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L 29732-66

ACC NR: AP6018343

≈ 3.2 Å (the focal length of the lens was 55 mm). The displacement [illegible] region toward the laser beam causing the Doppler shift of the line was attributed to the formation of a shock wave which intensely absorbed the laser light. A study of the third stage by high-speed photography (655,000 frames/sec) showed that the breakdown region expands during the first 3—5 μsec after the passage of the pulse and then decays during the next 30—40 μsec. The spectrum of the plasma in the visible range during the third stage showed the presence of NII, DII, and NI and H2. The electronic temperature during this stage was estimated to be about 3—6 x 10^4K. Orig. art. has: 6 figures, 6 formulas, and 1 table. [CS]

SUB CODE: 20/ SUBM DATE: 08Jun65/ ORIG REF: 010/ OTH REF: 010/ ATD PRESS: 5113

Card 2/2

L 02978-67 FSS-2/EWT(1)/FCC TT/GW

ACC NR: AP6032855 SOURCE CODE: UR/0020/66/170/003/0567/0569

AUTHOR: Grigorov, N. L.; Maduyev, V. L.; Mandel'shtam, S. L.; Pisarenko, N. F.; Savenko, I. A.; Tindo, I. P.

ORG: Institute of Physics im. P. N. Lebedev, Academy of Sciences, SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Investigation of corpuscular radiation by the Luna-10 artificial satellite

SOURCE: AN SSSR. Doklady, v. 170, no. 3, 1966, 567-569

TOPIC TAGS: solar corpuscular radiation, lunar orbit, lunar satellite, GAS DISCHARGE, COUNTER, SATELLITE DATA ANALYSIS

ABSTRACT: Gas-discharge counters (types SBT-9 and SF) were carried on the surface of Luna-10 (see Fig. 1). The SBT-9 had a window 0.2 cm^2 in area made of a 1.2 mg/cm^2 layer of mica covered by 0.3 mg/cm^2 gold sheet to decrease its registration effectiveness for solar x-rays with wavelengths shorter than 10 Å. This counter registered electrons and protons with energies greater than 40 kev and 0.5 Mev, respectively. The SF counter windows were aluminum sheets 2.7 mg/cm^2 thick and 0.5 cm^2 in area. These registered x-rays with wavelengths shorter than 14 Å, and electrons and protons with energies greater than 50 kev and 800 kev, respectively. The pulses from all counters were registered on logarithmic scales. The SF counter data were registered by independent logarithmic integrators. The telemetry system sampled the channels once every two minutes. The SBT-9 counter rate output increased in the

Card 1/3 UDC: 537.491—>523.165

L 02978-67

ACC NR: AP6032855

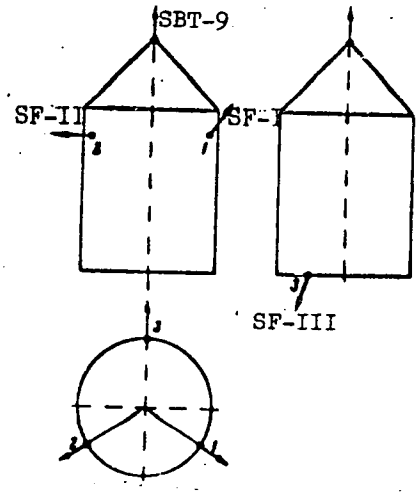

Fig. 1. Position of gas-discharge counters

first part of April, owing to x-ray radiation from the Sun. The SF counters were switched on on April 8. The satellite crossed the assumed boundary of the Earth's magnetospheric tail four times. During these periods all counters simultaneously indicated an increased activity. The maximum count in the period between 2 and 5 May was 50 pulses$\cdot$cm$^{-2}\cdot$sec$^{-1}\cdot$sterad for the SBT-9 counter and 40 pulses$\cdot$cm$^{-2}\cdot$sec^{-1}.

Card 2/3

L 02978-67

ACC NR: AP6032855 O

sterad for the SF counters. This activity is assumed to be due to unidirectionally moving electrons in the magnetosphere region whose energies exceed 40 kev. The data indicate that the Earth's magnetospheric tail is 60° wide and that the magnetic field does not form closed lines around the moon. Orig. art. has: 2 figures.

SUB CODE: 03,22/ SUBM DATE: 28Jun66/ ATD PRESS: 5099

ACC NR: AP7000545 SOURCE CODE: UR/0293/66/004/006/0827/0837

AUTHOR: Mandel'shtam, S. L.; Tindo, I. P.; Karev, V. I.
ORG: none

TITLE: Investigation of lunar x-ray radiation with the aid of the Luna-10 lunar satellite

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 6, 1966, 827-837
TOPIC TAGS: lunar radiation, x radiation, lunar satellite / Luna-10 lunar satellite

ABSTRACT:

During its orbital flight around the Moon, the Luna-10 determined several possible causes of lunar x-ray radiation: 1) reflection and scattering by the Moon's surface of incident x-rays from the sun; 2) bombardment of the lunar surface by high-energy particles such as are found in the solar wind; 3) bombardment of the Moon by electrons from the Earth's magnetosphere tail section; 4) natural radioactivity of the lunar surface; and 5) induced radioactivity caused by cosmic radiation. The most likely source of lunar x-ray radiation, however, is thought to be the incident solar x-rays which cause the lunar surface to fluoresce at characteristic lines K_α, which correspond to Si, Al, and Mg. The objective of the experiment was to measure the relative content of Si, Al, and Mg on the lunar surface and, if possible, to chart their geographic distributions.

 UDC: 629.195.3:523.36

ACC NR: AP7000545

The equipment used included two types of self-quenching Geiger counters with a neon-oxygen gas mixture used as the quenching agent. The aperture of one of the counters was covered with aluminum foil 2.7 mg/cm^2 thick. This counter was most sensitive to the radiation lines of Al and Mg. The other type of counter was shielded by 1.1-mg/cm^2 plate made of organic material. This counter was sensitive to Si, Al, and Mg radiation lines. Both types of counter had an aperture of 0.5 cm^2 and a field of view of 1 sterad. Three counters were placed on the satellite's surface as shown in the figure. Each counter was associated with a solar sensor (silicon phototransducer). The data from three Al-shielded counters were recorded by three separate logarithmic integrators. The counting range was limited to 5—500 counts/sec. The integrator time constant was approximately 10 sec. The counters with the organic-material covers supplied their data in parallel to a single integrator of the same type. These four integrators time-shared one telemetry channel. The output signals of the three parallel-connected solar sensors were amplified and transmitted to Earth through two telemetry channels. The telemetry system interrogated all outputs of the measurement channels once every two minutes.

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Measurements were taken from 8 April to 29 May 1966 during a total of only 40 telemetry sessions. Between 8-28 April and 23-29 May solar activity was very high. Owing to the satellite's constant rotation around its own axis, with a 30—40-sec period of revolution, and because of certain difficulties presented by the counters, the results are imprecise and inconclusive.

The modulated signals from counter III from 8 to 28 April are in all probability of solar origin. Signals from the solar sensors corroborate this assumption. The minimum cosmic background noise counter signal was approximately 12 counts/sec.

The lunar surface was in the field of view of both counters I and II (see Fig. 1). Counter I in almost every case gave a count below

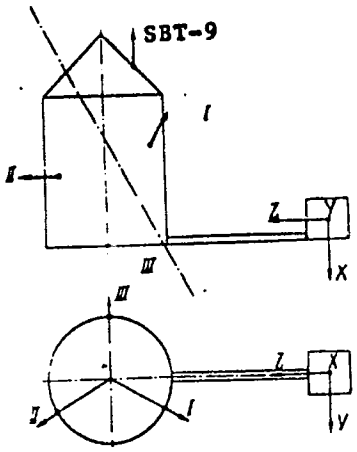


Fig. 1. Orientation of optical axes of x-ray counters (I, II, and III) and particle counter SBT-9, and orientation of the X, Y, and Z axes of the magnetometer

that of the cosmic noise. This would occur only if the counter was overloaded, as laboratory tests at different temperatures have indicated. An unexplained phenomenon occurred when counter I was recording approximately 500 counts/cm^2 -sec while the other counters (II and III) were recording only cosmic background, indicating that

the radiation was highly directional. It is assumed that this count was caused by lunar radiation, but the fact that the same phenomenon occurred on both the illuminated and dark sides of the Moon remains unexplained.

At times counter II also recorded radiation below the cosmic background noise, while at other times its measurements were close to the cosmic noise level. By comparing readings taken when the Luna-10 satellite was above the illuminated and the dark sides of the Moon with counter II directed at the Moon, it may be seen that the intensity of lunar x-ray radiation (less measurement errors) was 3—5 counts/cm^2 -sec.

The interpretation of data from the counters covered by organic material is complicated by the fact that all of them shared the same channel whose capacity was often exceeded by the high count rate, which is assumed to have been caused by induced noise in one of the counters.

The same Geiger counters also registered the impact of space particles (probably electrons) whenever the satellite crossed the

ACC NR: AP7000545

boundary of the Earth's magnetosphere tail section. This occurred in synchronism with the data from other sensors especially designed to detect the presence of the magnetosphere. The count during this time was 50 pulses/cm^2 -sec. If it is assumed that the impacting particles are electrons with E $\geq$ 40 kev, the corresponding count of 50 electrons/cm^2 -sec is obtained. This is in complete agreement with the observable facts. However, the flux due to electrons from the magnetosphere tail should give rise to x-ray bremsstrahlung with an intensity of approximately 0.1 photon/cm^2 -sec-sterad, which under certain assumptions about the makeup of the lunar surface would give rise to fluorescent x-ray radiation flux whose magnitude is considerably lower than expected.

No precise and unambiguous conclusions are reached by the authors, since the exact orientation of the Luna-10 satellite with respect to the Moon and the Sun is not known. The authors express a desire for continuing the lunar x-ray radiation experiments, but propose the use of more sensitive equipment. Orig. art. has: 2 figures. [FSB: v. 3, no. 1]

SUB CODE: 22, 03 / SUBM DATE: 08Aug66 / ORIG REF: 006 / OTH REF: 006

Card 6/6

S/119/60/000/07/04/017
B019/B063

AUTHOR: Mandel'shtam, S. M.

TITLE: Instruments of a Code Pulse System for Remote Measurements With Direct Conversion of the Angle of Rotation of an Indicator

PERIODICAL: Priborostroyeniye, 1960, No. 7, pp. 13-16

TEXT: The present paper describes the transmitter and receiver for a code-pulse remote measurement. The electromechanical temperature transmitter is designed for the measuring range -35 - +40°C, and the principle of conversion of the angle of rotation of the pointer of the primary instrument is explained by means of Fig. 1. The code combination used was suggested by S. M. Yakovlev and is given in Table 1. When describing the mode of operation of the transmitter, the author refers to the classification suggested by Ya. A. Kupershmidt. Fig. 2 shows a general view of this trade-marked instrument. The coding device is housed within a special casing. The code can easily be changed. The author refers to an instrument which is very similar to that described here. It was developed at the Lengiproinzh-proyekt under the supervision of L. A. Emdin, and was installed at the

Card 1/2

Instruments of a Code Pulse System for Remote Measurements With Direct Conversion of the Angle of Rotation of an Indicator

S/119/60/000/07/04/017
B019/B063

dispatcher point of Lengaz. It had several drawbacks which could be avoided in the instrument under consideration. Next, the advantages of the above-mentioned electromechanical transmitter are enumerated: Any code may be used, there are no temperature-sensitive circuit elements, and mercury contacts proved to be advantageous. A detailed description is given of the conversion of the angle to be transmitted into the code, as well as of the receiver shown in Fig. 3 (block diagram). This receiver uses well-known elements of telemetering and computer technique. The transmitter has, however, a complicated construction. The author continues further developments. A. D. Talantsev is also mentioned in this paper. There are 3 figures, 1 table, and 9 references: 6 Soviet, 1 Irish, and 2 American.

ASSOCIATION: Laboratoriya avtomatiki i telemekhaniki instituta "Giprospetsgaz", Leningrad (Laboratory of Automation and Telemechanics of the Institute "Giprospetsgaz", Leningrad)

VB

Card 2/2

MANDEL'SHTAM, S. M.; NOVITSKIY, P. V.

"Automatic Calculations in Measurement Engineering"
Report submitted at the Third Conference on Automatic Control and Electrical Measurement Methods was held at Novosibirsk, 19-23 Sept. 1961.

44265

S/785/61/000/008/004/005
E194/E155

9,7300

AUTHOR: Mandel'shtam, S.M.

TITLE: An inductive converter which gives digital readings of the angular position of an instrument pointer

SOURCE: USSR. Ministerstvo geologii i okhrany nedr. Osoboye konstruktorskoye byuro. Geofizicheskoye priborostroyeniye. no.8. 1961. 85-89

TEXT: The special feature of this inductive analogue-to-digital converter is the method of reading, which uses a Roer multi-vibrator. A non-magnetic disc with magnetically-soft inclusions suitably arranged round the periphery is fixed to the shaft of the indicating instrument. Arranged round the disc are a number of toroidal cores with slots wide enough to admit the magnetically-soft inclusions. To take a reading, a voltage is applied to a winding on the toroidal core; the direction of passage of the current is determined by a transistor flip-flop. This reverses the core magnetisation, so operating the other transistor and so on. The reversals of magnetic flux induce in a secondary winding a voltage of a certain frequency. The frequency

Card 1/2

An inductive converter which gives ... S/785/61/000/008/004/005
E194/E155

is high if the part of the disc in the gap of the toroid is non-magnetic and lower if it is magnetic. A further toothed rotor surrounded by an excited toothed stator draws the pointer to one position or the other, preventing false intermediate readings. The advantage of the arrangement is that it provides contactless conversion without the complication of optical methods and it allows great flexibility of coding. In a particular case a 150 mm diameter disc was used to read 60 scale points. The minimum width of a division was 5 mm. Half of the code inserts were made on a 150° sector of the disc, the other half were diametrically opposite. The device is intended for primary meters of high torque.
There are 2 figures.

Card 2/2

MAN DEL'SHTAM, S.M.

Estimating the error in linear interpolation. Geofiz. prib. no.10:69-73 '61. (MIRA 15:8)
(Prospecting--Geophysical methods)

26775
S/103/61/022/006/010/014
D229/D304

16.8000 (1031, 1121)

AUTHOR: Mandel'shtam, S.M. (Leningrad)

TITLE: Error of time quantization in automatic control

PERIODICAL: Avtomatika i telemekhanika, v. 22, no. 6, 1961, 780 - 786

TEXT: The author studies the subject with the aid of harmonical analysis. The conclusion are: 1) Apart from errors due to instruments and measurement methods, there is an additional irremovable error in the process of automatic control which is that of time quantization. The mean square value of this error σ_{vr} for a given function with limited spectrum can be determined with the aid of trigonometrical interpolation, from

$$\delta_{vr} = \sqrt{\frac{1}{2} \sum_{i=n+1}^{m} (a_i^2 + b_i^2)},$$

Card 1/2

Error of time quantization ...

a_i and b_i being the coefficients of the Fourier expansion of the function and 2n, the number of discrete readings. 2) This error can be easily determined for continuous functions with the aid of harmonical analyzers and synthetizers. 3) For periodical functions, the error of time quantization can be decreased by rational division of the function into intervals, an appropriate value of interpolation step being chosen for each interval. There are 2 figures and 3 Soviet-bloc references.

SUBMITTED: November 9, 1960

Card 2/2

NOVITSKIY, P.V.; MANDEL'SHTAM, S.M.

Automatic computers used in measurement equipment. Izm.tekh. no.5:1-4 My '62. (MIRA 15:6)
(Measuring instruments) (Electronic calculating machines)

S/115/62/000/005/005/006
E140/E435

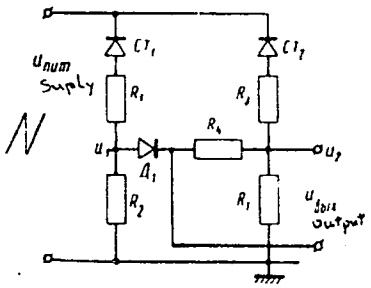
AUTHORS: Gol'dreyer, I.G. (deceased), Mandel'shtam, S.M.

TITLE: Resistance ratiometer

PERIODICAL: Izmeritel'naya tekhnika, no.5, 1962, 43-45

TEXT: A circuit based on a sawtooth-excited nonlinear bridge circuit is used to transform the ratio of two resistances to a time interval (Fig.1). Combined with a gated counter, the system yields a digital output. There are 3 figures.

Fig.1.



Card 1/1

MANDEL'SHTAM, S. M.

Cybernetic methods for improving measuring equipment. Priboro-stroenie no.10:30-31 O '62. (MIRA 15:10)

(Measuring instruments)

S/103/63/024/004/014/014
D201/D308

AUTHORS: Lanin, M.I., Mandel'shtam, S.M. and Sidel'nikov, V.V. (Leningrad)

TITLE: Some problems of the mathematical foundation governing the selection of the number of quantization regions in analog-to-digital converters

PERIODICAL: Avtomatika i telemekhanika, v. 24, no. 4, 1963, 573-578

TEXT: The authors consider the relationship between the amount of information and the magnitude of the quantization region for normal and even distribution of errors in analog-to-digital conversion and derive formulas which may be used as an objective basis for determining the number of quantization levels. The following simplifications are made in deriving the solution: it is assumed that the sections in front of the quantizer introduce random errors only; that there is no loss of information after the quantization and that no distinction is made between errors at the ends and at other points of the scale of the indicating instrument. Conclusions:

Card 1/2

Some problems ...

1) The information obtained from the measuring instrument with independent measurements and with a finite number N of quantization levels of the scale, is a monotonic function of this number N and tends asymptotically to a limit for an even distribution of the measured quantity and for an even and normal disturbance distribution. 2) The maximum amount of information is systems in which the amount of errors introduced at preceding stages is independent of the quantization region, is a function of statistical characteristics of these errors only. 3) For normal magnitudes of the quantization region of (0.5-2) a, where 'a' is a constant, determining the even error distribution, 90 to 75% of maximum possible information can be obtained from the indicating instrument, the mean square value of error being 140 to 240% of its minimum. 4) From the point of view of information indicators, the increase in the number of quantization regions is always useful irrespective of noise (provided this does not increase the amount of noise itself). There are 2 figures.

SUBMITTED: July 9, 1962

Card 2/2

MANDEL'SHTAM, S.M.

L 41182-65 EWT(d)/EWP(c)/EWP(v)/T/EWP(k)/EWP(l) Pf-4
ACCESSION NR: AP5004677 S/0115/64/000/009/0058/0059

AUTHOR: none

TITLE: Fourth scientific and technical conference on "Cybernetics for the improvement of measurement and inspection methods"

SOURCE: Izmeritel'naya tekhnika, no. 9, 1964, 58-59

TOPIC TAGS: cybernetics, electric measurement, electric quantity instrument, digital computer, electronic equipment, electric engineering conference

ABSTRACT: The conference was held 1-4 July at the All-Union Scientific Research Institute of Metrology by the Section of Electrical Measurements of the Council on the Problem of "Scientific Instrument Making" of the State Committee on Coordination of Scientific Research Work in the USSR together with the All-Union Scientific Research Institute of Electrical Measurement Instruments and the Leningrad Regional Administration of the Scientific and Technical Division of the Instrument Making Industry. More than 400 delegates from 29 cities of the country participated. Fifty-seven reports were heard and discussed. Reports were given by: P. V. NOVITSKIY (Leningrad)--"Definition of the Concept of Informational Error in Measurement and its Importance in Practical Use" and "On the Problem of the Average Informational Criterion of Accuracy Throughout the Entire Scale of an Instrument"; Ya. A.

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ACCESSION NR: AP5004677

17

KUPERSHMIDT (Moscow)--"On Determination of the Criteria of Accuracy for Measurement Devices"; S. M. MANDEL'SHTAM (Leningrad)--report on a new criterion of accuracy of measurement instruments; F. F. PARSHIN (Leningrad)--report on optimization when using Fourier transforms on electronic digital computers; S. P. DMITRIYEV, G. Ya. DOLGINTSEVA and A. A. IGNATOV (Leningrad)--proposal of a new method for solving problems of optimum filtering for non-stationary random signals and interference; I. B. CHELPANOV--"Calculation of the Dynamic Characteristics of an Optimum Complex Two-Channel System which Uses Signals from a Position Meter and from a Speed Meter"; R. A. POLUEKTOV (Leningrad)--"Optimum Periodic Correction in the Measurement of Continuous Signals"; S. P. ADAMOVICH (Moscow)--"Analysis and Construction of Devices for Correction of Non-linearity and Scaling for Unitary Codes; G. V. GORELOVA (Taganrog)--"A Method for Statistical Optimization in Graduating the Scales of Electrical Measuring Instruments"; M. A. ZEMELIMAN (Moscow)--"Analog-Digital Voltage Converter with Automatic Error Correction"; B. N. MALINOVSKIY, V. S. KALENCHUK and I. A. YANOVICH (Kiev)--"Automatic Monitoring of the Parameters of the Electrical Signals of Complex Radio and Electronic Equipment"; V. P. PEROV (Moscow)--"Operational Cybernetics as an Independent Scientific Specialization"; Ye. N. GIL'BO (Leningrad)--"On the Problem of Effective Non-linear Scales"; A. I. MARKELOV (Moscow)--"Devices for Preliminary Processing of the Results of Measurements Presented in the Form of

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ACCESSION NR: AP5004677

Graphic Recordings For Subsequent Introduction of the Information into Universal Digital Computers"; O. M. MOGILEVER and S. S. SOKOLOV (Leningrad)--"On a Method for Reducing Excess Information"; T. V. NIKOLAYEVA (Leningrad)--"A Device for Temporal Discretization of Continuous Signals"; A. A. LYOVIN and M. L. BULIS (Moscow)--"Optimization of the Transmission of Telemetric Information as a Means for Raising the Efficiency and Eliminating Interference"; D. E. GUKOVSKIY (Moscow)--"On a Statistic Approach to the Detection of Events in Automatic Inspection"; M. I. LANIN (Leningrad)--"Method for Calculating the Holding Time of Communications in a Centralized Inspection System or Constant Servicing Time"; O. M. BRONSHTEYN, A. L. RAYKIN and V. V. RYKOV (Moscow)--"On a Single-Line Mass Service System with Losses"; V. M. SHLYANDIN (Penza)--report on circuit designs for direct compensation electrical digital measuring instruments; K. N. KOMOV (Novocherkassk)--report on a new method for compensation of digital bridges; M. N. GLAZOV (Leningrad)--report on the problem of voltage-to-angular rotation conversion; V. S. GUTNIKOV (Leningrad)--"Methods for Construction of Frequency Capacitance Pickups with a Linear Scale"; R. Ya. SYROPYATOVA and R. R. KHARCHENKO (Moscow)--report on the determination of the amplitude-frequency and phase characteristics of PFM and PWM modulators; Ye. I. TENYAKOV (Novocherkassk)--"The Phototransistor as a Switch for Electrical Measurement Purposes"; N. V. MALYGINA (Leningrad)--a report on ways for making universal equipment for measurement of current, voltage and power; P. P. ORNATSKIY and V. I. ZOZULYA (Kiev)--reports on the construction of static voltmeters, wattmeters and

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ACCESSION NR: AP5004677

phase meters; A. V. TRIKHANOV, I. G. SMYSHLYAYEV, N. I. SABLIN, V. M. RAZIN and V. A. GORBUNOV (Tomsk)--report on a device for automatic processing of the measurements of vibration amplitude of pneumatic hammers; L. K. RUKINA and V. G. KNORRING (Leningrad) --report on the development of a digital compensator for measuring pressure, force, etc.; N. B. DUDUKINA (Leningrad)--report on a method for constructing frequency pickups for gas analysis; Ye. M. KARPOV, V. A. BRAZHNIKOV and B. Ya. LIKHTTSINDER (Kuybyshev)--reports on analysis and recording of boring speeds; Yu. V. PSHENICHNIKOV (Kuybyshev)--"A High Speed Voltage-to-Digital Code Converter for ac Pickups"; G. P. VIKHROV and V. K. ISAYEV (Vilna)--"A Highly Accurate Digital Peak-to-Peak Voltmeter"; and S. M. PERGIN (Leningrad)--"A Low Level Analog-Digital Voltage Converter."

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: EE, EC

NO REF SOV: 000 OTHER: 000 JPRS

mc

Card 4/4

L 17557-65 EWT(d)/EEC(k)-2/EEC-4 Po-4/Pq-4/Pg-4/Pk-4/Pl-4 RAEM(c)

ACCESSION NR: AP5000153 S/0103/64/025/011/1618/1627

B

AUTHOR: Mandel'shtam, S. M. (Leningrad)

TITLE: Information content obtained with different laws of distribution of measurand and error

SOURCE: Avtomatika i telemekhanika, v. 25, no. 11, 1964, 1618-1627

TOPIC TAGS: information content, measurand, measuring error

ABSTRACT: Formulas are developed for the information content in these laws of the distribution of probabilities of the true measurand value and error value: uniform distribution of measurand and constant quantization interval, uniform error distribution; same, but triangular error distribution; same, but normal error distribution; nonuniform distribution of measurand, uniform error distribution; correlated measurements. The information-content vs. number-of-quantization-domains curve rises to the limit set by the measurand-dispersion to error-dispersion ratio. The residual ambiguity is higher for a more uniform

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ACCESSION NR: AP5000153

error distribution, for the same basis of error distribution, and other equal conditions. A normal distribution of both the measurand and error with no correlation between readings yields maximum information. The presence of systematic errors does not affect the info content because the values of these errors are known. Obtaining positive info is possible not only with practically used $L/\sigma_\varepsilon > 60$ but also with much higher errors up to $\sigma_m < \sigma_\varepsilon$ (here, L is the measurand range; σ_m and σ_ε are the mean square true values of the measurand and error, respectively). The effect of the time-quantization interval on the information content is expressed as a gradually rising curve having a constant ceiling determined by the info content obtained from independent measurements. Orig. art. has: 1 figure and 50 formulas.

ASSOCIATION: none

SUBMITTED: 12Apr63 ENCL: 00

SUB CODE: DP NO REF SOV: 003 OTHER: 000

Card 2/2

L 35842-66

ACC NR: AP6015210 SOURCE CODE: UR/0410/65/000/001/0084/0093

AUTHOR: Mandel'shtam, S. M. (Leningrad)

ORG: none

TITLE: Evaluation of some methods of statistical matching between a measuring instrument and its measurand [Reported at the 6th All-Union Conference on Automatic Control and Electric Measurements, Sep 64, Novosibirsk]

SOURCE: Avtometriya, no. 1, 1965, 84-93

TOPIC TAGS: measurement, measuring instrument, information processing

ABSTRACT: An informational approach to the description of a measuring instrument is developed. Measurements are supposed to be dependent (correlated with preceding ones). It is demonstrated how the speed of information transmission through a measuring channel can be increased, in some cases, by

Card 1/2 UDC: 621.391.1:621.317.7

L 35842-66

ACC NR: AP6015210

statistically matching the instrument to its measurand. A concept of an incoming-information-flow parameter is introduced; this parameter is single-valuedly determined by the instrument scale. A formula is developed for the entropy in dependent measurements, and a plot of information content vs. interrogation interval is presented. By selecting a certain relation between the number of level-quantization zones and the quantization interval, maximum information carrying capacity can be attained (optimization) in sweep-type analog-digital transducers. Optimization of analog-digital transducers with digit-by-digit balancing and space coding is also discussed. The incremental measurement can be advantageous when handling slow processes and using an "enlarged" scale part; the reduction of error and limits of applicability of this method of measurement are considered. The new formulas illustrate the fruitfulness of the statistical-matching approach and permit practical solution of some particular problems. Orig. art. has: 7 figures and 31 formulas.

SUB CODE: 14, 09 / SUBM DATE: 12Sep64 / ORIG REF: 012

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L 30352-66 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l)

ACC NR: AP6007159 (A) SOURCE CODE: UR/0115/65/000/012/0003/0009

AUTHOR: Kavalerov, G. I.; Mandel'shtam, S. M.

ORG: none

TITLE: Criteria for evaluating measuring means and the quality of measurements

SOURCE: Izmeritel'naya tekhnika, no. 12, 1965, 3-9

TOPIC TAGS: measuring instrument, measurement

ABSTRACT: Based on 1949-65 Soviet and 1943-62 Western publications, a review of modern criteria applied to measurements and instruments is presented. These criteria are, in fact, various functionals of multivariate density of probability of the random process which determines the real measurement error, the latter being the difference between present values at the instrument input and output. These error functionals are considered: (a) static errors — maximal, mean, and

Card 1/2 UDC: 681.2.088.001.1

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ACC NR: AP6007159

mean-square; (b) dynamic errors — time-discrete-measurement error, analog-unit-inertia error, and backlash-and-hysteresis error. These information evaluations are analyzed: (a) static — information content per one measurement and (b) dynamic — rate of information transmission. Formulas for various types of errors and evaluations are cited. The information description provides a complete evaluation of the measuring instrument as it includes all types of errors; in many practical cases, the description of errors is sufficient. Orig. art. has: 1 figure and 48 formulas.

SUB CODE: 13, 09 / SUBM DATE: none / ORIG REF: 017 / OTH REF: 009

Card 2/2

L 40033-66 EWT(1) IJP(c) JD/JW/JG

ACC NR: AP6016142 SOURCE CODE: UR/0103/66/000/005/0167/0171

AUTHOR: Mandel'shtam, S. M. (Leningrad)

ORG: none

TITLE: Reliability criteria for information systems

SOURCE: Avtomatiki i telemekhanika, no. 5, 1966, 167-171

TOPIC TAGS: system reliability, information processing

ABSTRACT: A reliability criterion for an information system

$$\eta = \frac{I}{I_0} 100(\%),$$

is suggested, where I_0 is the mean quantity of information obtained with a nominal distribution of errors and noises, and I is the mean quantity of information obtained during the actual operation of the device with consideration of the statistically nonsteady state of errors of the device, and self-regulation. This criterion reflects the distribution probability of the input signals, the statistical nature of the failures (i. e., random, self-regulating failures vs. failures that require the intervention of a human agency), and a quantitative evaluation of the failures (i. e., how much information is lost as a result of a certain type of failure). Criterion η can

UDC: 621.3.019.3

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ACC NR: AP6016142 O

be computed by testing the entire system, or testing separate units. To make η an operational criterion, extensive statistical research of individual elements would be required. Orig. art. has: 14 formulas.

SUB CODE: 14,05,09/ SUBM DATE: 12Apr65/ ORIG REF: 003

Card 2/2

BRUSILOVSKIY, Korneliy Aleksandrovich; SHLYAPOBERSKIY, V.I., dots., retsenzent; MANDEL'SHTAM, S.M., kand. tekhn. nauk, retsenzent; SIDEL'NIKOV, V.V., dots., otv. red.

[Measurements of pulse distortions in discrete information transmitting systems] Izmereniia iskazhenii impul'sov v sistemakh peredachi diskretnoi informatsii. Moskva, Nauka, 1965. 110 p. (MIRA 18:8)

MANDEL'SHTAM, S.M.

Reviews. Izm. tekh. no.8:63-64 Ag '65. (MIRA 18:9)

MANDEL'SHTAM, S. Z.

Mandel'Shtam, S. Z.--"Yevgeniy Konstantinovich Sepp (Neuro-patholo i t, on his 70th birthday)," Sbornik nauch. rabot, posvyashch. 70-letiyu prof. Seppa, Moscow, 1948, p. 5-18, with picture

SO: U-3264, 13 April 1953, (Letopis 'Zhurnal 'nykh Statey, No. 2, 1949)

L 14970-63 EWA(k)/EPF(n)-2/EWT(l)/EWP(q)/EWT(m)/BDS/T-2/3W2/EEC(b)-2/
ES(t)-2 AFFTC/ASD/ESD-3/RADC/APGC/AEWL/SSD Pu-4/Pi-4 GG/WH/WG/JHB/IJP(C)/K/EH
ACCESSION NR: AP3005342 S/0181/63/005/008/2306/2309

AUTHOR: Kask, N. Ye.; Korniyenko, L. S.; Mandel'shtam, T. S.; Prokhorov, A. M.

TITLE: Spin-lattice relaxation of the Ti^{3+} ion in corundum

SOURCE: Fizika tverdogo tela, v. 5, no. 8, 1963, 2306-2309

TOPIC TAGS: spin-lattice relaxation, single-phonon process, Ti^{3+} ion, titanium-doped corundum, electron paramagnetic resonance, pulse-saturation method

ABSTRACT: The spin-lattice relaxation of the Ti^{3+} ion in corundum has been studied by the pulse saturation method. Experiments were conducted using a superheterodyne spectroscope in the 3-cm band. A cryogenic cavity was employed which allowed rotation of the sample around two mutually perpendicular axes and thus permitted all possible orientations of the crystal axis with respect to the external magnetic field for crystals with axial symmetry. The temperature dependence of spin-lattice relaxation in the 1.7 to 3.5K range was determined. It was shown that below the 2K relaxation is determined by single-phonon processes and the relaxation time varies as $e \exp(d/kT)$ at $d = (30 \pm 3)$ cm^{-1}. The dependence of relaxation time in single-phonon processes on the external magnetic field determined on the basis of other relationships and the value of the experimentally

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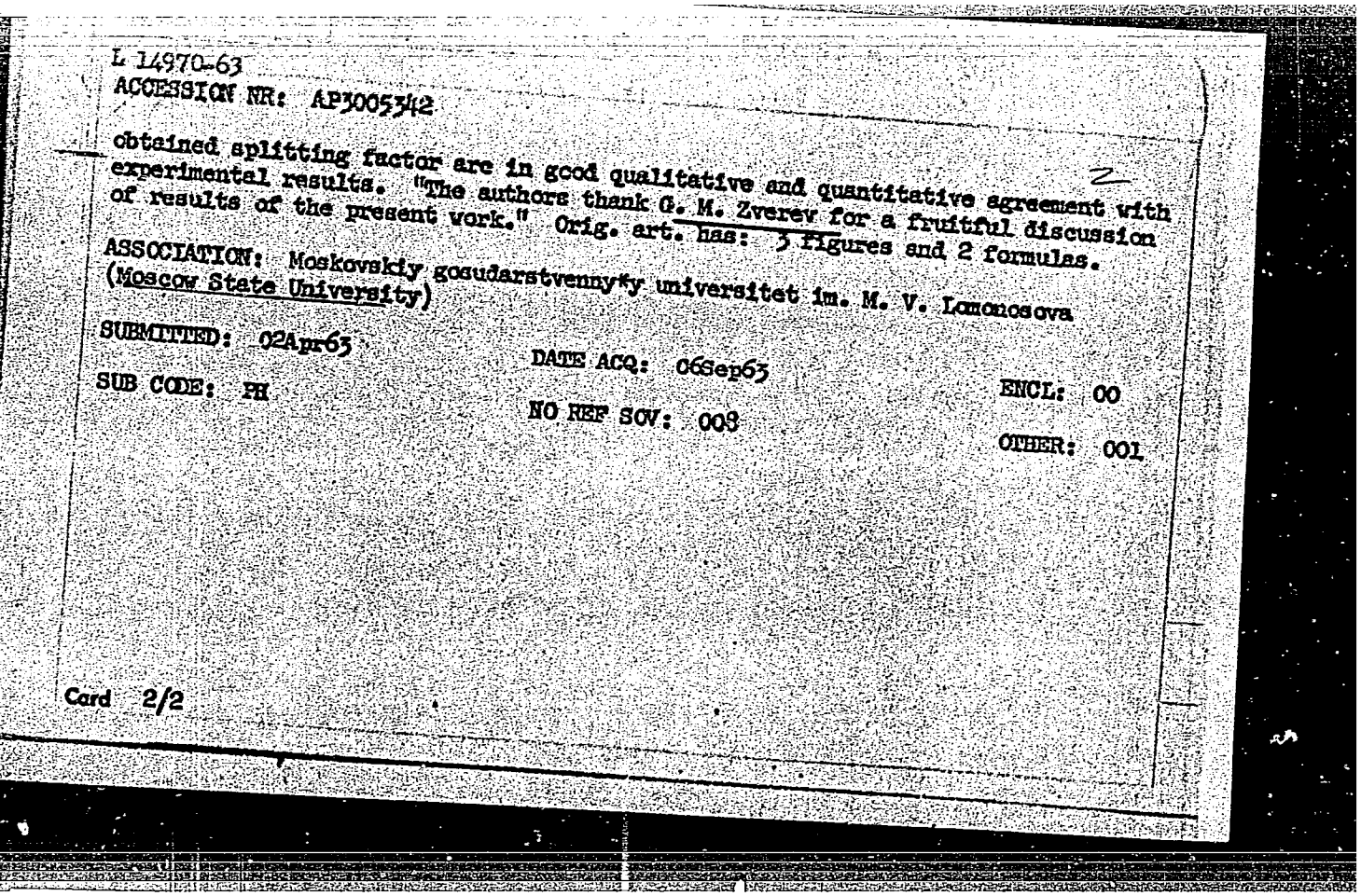

L 14970-63
ACCESSION NR: AP3005342

obtained splitting factor are in good qualitative and quantitative agreement with experimental results. "The authors thank G. M. Zverev for a fruitful discussion of results of the present work." Orig. art. has: 3 figures and 2 formulas.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 02Apr63 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: PH NO REF SOV: 003 OTHER: 001

Card 2/2

ACC NR: AP7000401 SOURCE CODE: UR/0386/66/004/009/0373/0376

AUTHOR: Vinogradov, Ye. A.; Irisova, N. A.; Mandel'shtam, T. S.; Prokhorov, A. M.; Shmaonov, T. A.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Resonance absorption of the V^{3+} ion in corundum at 1.21 mm wavelength

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 4, no. 9, 1966, 373-376

TOPIC TAGS: corundum, vanadium, resonance absorption, low temperature research, microwave spectroscopy, hyperfine structure

ABSTRACT: The authors report an experimental investigation of resonance absorption of the V^{3+} ion in corundum at wavelength $\lambda \sim 1.21$ mm and at liquid-helium temperature in magnetic fields from 0 to 5 kOe. The observed absorption corresponded to transitions from the lower level corresponding to the singlet state $S_{Z'} = 0$ to the levels of the higher doublet ($S_{Z'} = \pm 1$). The resonance absorption of the V^{3+} (~0.1%) in corundum was measured with a quasioptical feed-through spectroscope without cavity, which was constructed by the authors. The radiation source was a backward-wave tube generating an average of ~3 mW in the range from 0.83 to 1.35 mm. The microwave power was fed quasioptically to a sample placed in a helium cryostat via teflon windows in the cover. The helium cryostat could be placed between the poles of an electromagnet. Two series

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ACC NR: AP7000401

of measurements were made. In the first, the absorption line was investigated in different constant magnetic fields, including zero field, with the microwave-oscillator frequency continuously variable. In a zero field, two closely-spaced absorption lines were observed, corresponding to transitions from the lower singlet level of the V^{3+} ion to the levels of the doublet $S_{z'} = \pm 1$. The frequencies of the transitions from the lower level to each of the doublet levels were found to be $D_1 = (247.3 \pm 0.3)$ and $D_2 = (248.9 \pm 0.3)$ GHz, and the initial splitting of the doublet was $2E = (1.6 \pm 0.6)$ GHz. The calculated coefficient of resonance absorption of V^{3+} in corundum was $\alpha \geq 0.3$ cm^{-1}. The second series of measurements was made at a number of fixed frequencies with the magnetic field varied from 0 to 5 kOe. The absorption line observed in this case consisted of eight hfs components. The splitting between the singlet and the doublet, equal to 247.8 GHz, coincides within the limits of experimental error with $D = (D_1 + D_2)/2$ determined in the first measurement series. When the external magnetic field tends to zero, the distance between the outermost components yields the upper limit of the initial doublet splitting, $2E \leq 2.1$ GHz.

The authors are grateful to V. Kh. Sarkisov, director of the Corundum Laboratory of Kirivokanskiy khimkombinat, for supplying the investigated sample. Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 28Jul66/ ORIG REF: 002/ OTH REF: 005
ATD PRESS: 5107

Card 2/2

*Diffuse carcinoma of the skin following primary affection of the cervix uteri (Russian text) AKUŠ. I GINEK. 1953, 5 (83-84) Illus. 2 (XIII, 5, 16)

SO: EXCERPTA MEDICA, Sec. XIII, Vol1 9 No. 2, February 1955

USSR/Human and Animal Physiology - Nervous System.
Vegetative Nervous System. I-10

Abs Jour : Ref Zhur - Biol., No 13, 1958, 84617

Author : Vachnadze, I.K., Mandel'shtam, V.A.

Inst : First Leningrad Institute of Medicine.

Title : The Characteristics of Some Vegetative Reactions in Women at the Presence of a Full-Term or Extended Pregnancy.

Orig Pub : Sb. nauchn. tr. Kafedry akusherstva i ginekol. I-y Leningr. med. in-t, 1957, vyp. 1, 42-50.

Abstract : No abstract.

Card 1/1

MANDEL'SHTAM, Vladimir Aleksandrovich

[Cytodiagnosis of cancer of the uterus; a manual for physicians] TSitologicheskaia diagnostika raka matki; posobie dlia vrachei. Petrozavodsk, Gos. izd-vo Karel'skoi ASSR, 1958. 98 p.
(UTERUS--CANCER) (MIRA 12:5)

MANDEL'SHTAM, V.A.

Primary cancer of the fallopian tube. Vop.onk. 6 no.2:57-61 F '60. (MIRA 14:2)

(FALLOPIAN TUBES--CANCER)

MANDEL'SHTAM, V.A.

Modified vaginal speculum with a device for the collection of curettage material. Akush. i gin. 36 no.2:126 Mr-Ap '60. (MIRA 13:12)
(SPECULUM (MEDICINE))

MANDEL'SHTAM, V. A.

Metastases of a skin melanoma of the head to the ovary. Vop. onk. 8 no.4:83-85 '62. (MIRA 15:4)

1. Iz ginekologicheskogo otdeleniya (zav. - prof. V. P. Tobilevich) Instituta onkologii AMN SSSR (dir. - deystv. chl. AMN SSSR, prof. A. I. Serebrov)

(OVARIES—CANCER) (FACE—CANCER)

MANDEL'SHTAM, V.A.

Secondary bone lesions in cancer of the female genitalia.
Vop. ork. 8 no.11:89-96 '62. (MIRA 17:6)

1. Iz ginekologicheskogo otdeleniya (zav.- prof. V.P. Tobilevich) Instituta onkologii AMN SSSR (dir.- deystvitel'nyy chlen AMN SSSR, prof. A.I. Serebrov).

MANDEL'SHTAM, V.A., kand. med. nauk

Hemorrhages during the menopause and diagnosis of precancerous and cancerous diseases of the genitalia. Akush. i gin. no.1: 107-112 '65. (MIRA 18:10)

1. Ginekologicheskoye otdeleniye (zav.- prof. V.P. Tobilevich) Instituta onkologii (dir.- deystvitel'nyy chlen AMN SSSR prof. A.I. Serebrov) AMN SSSR, Leningrad.

MANDEL'SHTAM, V.A.

Effect of chrysomallin in primary multiple malignant tumors.
Vop. onk. 11 no.12:89-91 '65. (MIRA 19:1)

1. Iz ginekologicheskogo otdeleniya (zav. - prof. V.P. Tobilevich) Instituta onkologii AMN SSSR (dir. - deystvitel'nyy chlen AMN zasluzhennyy deyatel' nauki RSFSR prof. A.I. Serebrov).

MANDEL'SHTAM, Ye. M.

MANDEL'SHTAM, Ye. M: "Changes in capillary resistance in vascular diseases of the brain". Leningrad, 1955. Min Health RSFSR. Leningrad Sanitary-Hygienic Medical Inst. (Dissertations for the degree of Candidate of Medical Science.)

SO: Knizhnaya Letopis' No. 50 10 December 1955. Moscow.

MANDEL'SHTAM, Ye. Ya.

PHASE I BOOK EXPLOITATION SOV/5153

Garmonov, I.V., and B. S. Kurtkevich, Resp. eds.

Sintez monomerov dlya proizvodstva sinteticheskogo kauchuka (Synthesis of Monomers for the Production of Synthetic Rubber) Leningrad, Goskhimizdat, 1960. 250 p. Errata slip inserted. 4,500 copies printed.

Sponsoring Agencies: Gosudarstvennyy komitet Soveta Ministrov SSSR. Upravleniye SK i neftekhimii. Giprokauchuk i VNIISK.

Eds.: S.A. Zonis and Ya. I. Shur; Tech. Ed.: T.A. Fomkina.

PURPOSE: This book is intended for scientists, engineers, and technicians working in the synthetic rubber, plastics, and petroleum refining industries, and in scientific research institutes affiliated with these industries.

COVERAGE: The book contains articles which report on research carried out at the Nauchno-issledovatel'skiy institut sinteticheskogo kauchuka imeni Akademika S.V. Lebedeva (Scientific Research Institute for Synthetic Rubber imeni Academician S.V. Lebedev) and the Gosudarstvennyy proyektnyy i nauchno-issledovatel'skiy institut promyshlennosti sinteticheskogo kauchuka (State Scientific Research and Design Institute of the Synthetic Rubber Industry) in the synthesis of isoprene, styrene, acetylenes, acetaldehyde, and other initial products for synthetic rubber production. The articles also discuss methods of extracting these products from their preparatory media. No personalities are mentioned. References accompany individual articles.

TABLE OF CONTENTS: -

Card 1/6

11

YU. E. MANDELSHTAM

USSR/Human and Animal Physiology. The Nervous System. V

Abs Jour: Ref. Zhur-Biol., No 6, 1958, 27328.

Author : Yu.E. Mandel'shtam
Inst : The Leningrad Medical Institute of Sanitationa and Hygiene and the National Institute of Childhood Orthopedics.
Title : The Problem of the Interrelationships of the Spinal Centers of Different Muscles.

Orig Pub: Tr. Leningr. san-gigien. med. in-ta i N.-i detsk. orto-ped. in-ta, 1956, 29, 74-78.

Abstract: Frogs' brains were destroyed and different pairs of leg muscles were prepared (9 pairs). The flexor reflex was produced by pinching the toes of a posterior foot with a forceps. In all of the tests both muscles of a test pair contracted. Recipro-

Card : 1/2

ZUBZHITSKIY, Yu.N., MALYUKOVA, I.V., MANDEL'SHTAM, Yu.Ye.

In vivo study o the sensitivity of nerve cell protoplasm to novocaine . Trudy LSGMI 45:172-183 '58 (MIRA 11:11)

1. Kafedra obshchey biologii Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta (zav. kafedroy - chlen-korrespondent AMN SSSR, prof. P.V. Makarov).
(NERVES)
(NOVOCAINE)

MANDEL'SHTAM, Yu.Ye.

Nature of neuromuscular transmission in the migratory locust (Locusta migratoria). Dokl. AN SSSR 141 no.5:1250-1252 D '61. (MIRA 14:12)

1. Institut evolyutsionnoy fiziologii im. I.M. Sechenova AN SSSR. Predstavleno akademikom Ye.N. Pavlovskim.
(NERVOUS SYSTEM--INSECTS)
(CHOLINESTERASE)

BRIK, I.L., MANDELSHTAM, YU.YE.

Cholinergic, systems of insects and the mechanism of the insecticidal action of the organophosorus compounds.

Khimiya i Primeneniye Fosfororganicheskikh Soyedineniy (Chemistry and application of organophosphorus compounds) A. YE. ARBUZOV, Ed. Publ. by Kazan Affil. Acad. Sci. USSR, Moscow 1962, 632 pp.

Collection of complete papers presented at the 1959 Kazan Conference on Chemistry of Organophosphorus Compounds.

MANDEL'SHTAM, Yu.Ye.

Physiological mechanisms of the effect of phosphorus organic compounds on insects. Ent. oboz. 42 no.2:329-336 '63. (MIRA 16:8)

1. Institut evolyutsionnoy fiziologii imeni I.M.Sechenova AN SSSR, Leningrad.

(Phosphorus organic compounds--Physiological effect)
(Insects, Injurious and beneficial--Control)

MANDEL'SHTAM, Yu.Ye.

Electron microscopic study of the muscles in insects. Zhur. evol. biokhim. i fiziol. 1 no.5:391-397 S-O '65.
(MIRA 18:10)

1. Laboratoriya evolyutsionnoy morfologii i laboratoriya evolyutsii nervno-myshechnoy funktsii Instituta evolyutsionnoy fiziologii i biokhimii imeni Sechenova AN SSSR, Leningrad.